What is claimed is:

1. A method for estimating the pose of an articulated figure, comprising the steps of:

obtaining dense range data which describes the distance of points on the figure from a reference; and

processing said dense range data to estimate the pose of the figure.

2. The method of claim 1 wherein the dense range data is processed in accordance with a set of depth constraints to estimate the pose.

3. The method of claim 2 wherein said depth constraints are linear.

4. The method of claim 2 further including the steps of obtaining brightness data from an image of the figure, and processing said brightness data in accordance with a set of linear brightness constraints to estimate the pose.

5. The method of claim 2 wherein said depth constraints are represented by means of twist mathematics.

6. The method of claim 1 wherein said dense range data is compared with an estimate of pose to produce an error value, and said estimate is iteratively revised to minimize said error.

7. The method of claim 6 wherein the estimate of pose is generated with reference to a model of the figure.

8. The method of claim 7 wherein said model comprises a set of planar patches which respectively correspond to segments of the articulated figure.

9. The method of claim 8 wherein each patch comprises the convex hull of two circles.

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10. The method of claim 1 further including the steps of obtaining brightness data from an image of the figure, and processing said brightness data in accordance with a set of brightness constraints to estimate the pose.

11. A method for estimating the pose of an object, comprising the steps of:

obtaining dense range data which describes the distance of points on the object from a reference; and

processing said dense range data in accordance with a set of linear depth constraints to estimate the pose of the object.

12. The method of claim 11 wherein the object is articulated.

13. The method of claim 12 wherein said depth constraints are represented by means of twist mathematics.

14. The method of claim 13 further including the steps of mapping parameters which describe rotation and translation of the object to a set of linear parameters, solving for the depth constraints, and re-mapping back to the original parameters to provide a pose estimate.

15. The method of claim 11 wherein further including the steps of obtaining brightness data from an image of the object, and processing said brightness data in accordance with a set of linear brightness constraints to estimate the pose.

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16. The method of claim 11, wherein an estimate of the pose of the object includes an estimate for each of the orientation and translational positions of the object, and further including the steps of decoupling the estimate of orientation from the estimate of translational position.

17. The method of claim 12, wherein said reference comprises a location on the object, and the pose is estimated, at least in part, from the positions of points on the object relative to said location.

18. The method of claim 11, wherein the pose of the object is estimated for each image in a sequence of images, and further including the step of selecting a rigid translation value for each point on the object from one image to the next.

19. The method of claim 18, wherein said rigid translation value is an integer value.

20. The method of claim 18, wherein the rigid translation values are different for different points on the object.

21. A method for estimating the pose of an object appearing in a sequence of video images, comprising the steps of:

obtaining dense brightness data for pixels in each of said video images;

obtaining dense range data for pixels in each of said video images;

determining an initial pose for the object in one of said video images; and

estimating changes in at least one of the translational position and rotational orientation of the object for successive images, on the basis of said brightness data and said range data, to thereby estimate the pose of the object in successive images.

22. The method of claim 21, wherein the object is an articulated object.

23. The method of claim 21, wherein said estimates are obtained by means of linear constraint equations that are applied to said brightness data and said range data.

24. A method for estimating the pose of an articulated object appearing in a sequence of video images, comprising the steps of:

establishing a model for the surfaces of the articulated object;

obtaining dense range data for pixels in each of said video images;

generating a hypothetical pose for the object and determining the correlation of the hypothetical pose to the range data for an image; and

recursively generating successive hypothetical poses and determining the correlation of each hypothetical pose to identify the pose having the closest correlation to the range data.

25. The method of claim 24, wherein the estimate of pose is generated with reference to a model of the figure.

26. The method of claim 25, wherein said model comprises a set of planar patches which respectively correspond to segments of the articulated figure.

27. The method of claim 25, wherein the correlation is determined with respect to pixels in an image that are located within a predetermined distance of edges of said planar patches.